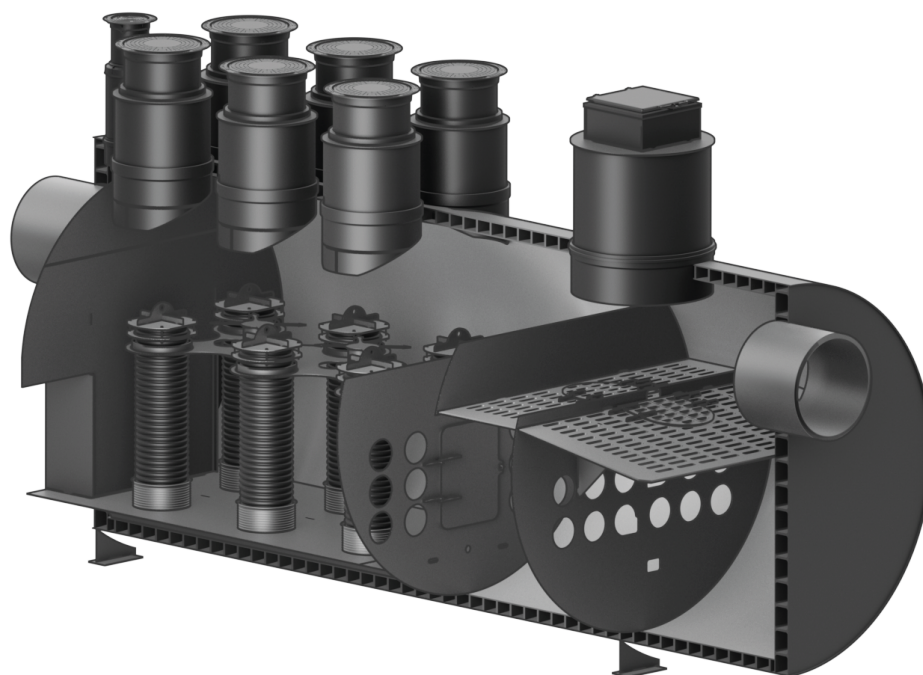


Installation and Maintenance Manual

Stormwise - Treatment



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Ebnatstrasse 111

8201 Schaffhausen

Switzerland

Original installation and maintenance manual

Disclaimer

The technical data within this document is not binding. It does not constitute expressly warranted characteristics, guaranteed properties or guaranteed durability. It is subject to modification. Our General Terms of Sale apply.

Observe the installation and maintenance manual

The installation and maintenance manual is part of the product and an important element within the safety concept.

- ▶ Read and observe the installation and maintenance manual.
- ▶ Always have the installation and maintenance manual available by the product.
- ▶ Give this installation and maintenance manual to all subsequent users of the product.

Issue History

Version	Date	Changes
1.0	2026/03	First edition

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1 About this document

This installation and maintenance manual describes the lifecycle of a Stormwise treatment unit from transport, installation and operation to maintenance, troubleshooting and disposal as well as safety information.

1.1 Target group

The following persons must read and observe this installation and maintenance manual:

- Persons who transport and install the treatment unit
- Persons who operate, maintain or troubleshoot the treatment unit
- Persons who dispose of the treatment unit

1.2 Notes on technical documentation

The technical documentation comprises the following documents:

Documents
Installation and maintenance manual
Technical drawings
Fact sheets

These documents are available at www.gfps.com or from the local representative of GF Industry and Infrastructure Flow Solutions.

The following rules apply to technical documentation:

- ▶ Replace old versions with new versions.
- ▶ Include all additional documentation.
- ▶ Pass documentation on to the new owner.
- ▶ Regularly check for the latest version.

1.3 Customer service

- Information regarding warranty is included in the GF terms and conditions.
- Visit our webpage to get in touch with your local specialist regarding any questions about your GF solution, required trainings or any form of customer service: www.gfps.com/our-locations

1.4 Copyright

Without express written consent from GF Industry and Infrastructure Flow Solutions no part of this document may be copied, transmitted by photographic means, reproduced, translated and stored on another electronic medium.

1.5 Related standards and regulations

Standard	Content	Application
DIN 16961	Classification, dimensions, tolerances & delivery conditions for thermoplastic profile-wall pipes	Sewer pipes, wastewater
DIN EN 13476	Requirements & testing for structured-wall plastic pipes (PVC U, PP, PE)	Sewer pipes, wastewater
DIN EN 13598	Specifies requirements, testing procedures, materials, sizes, performance, and labeling for inspection chambers and manholes	Gravity sewer and drainage systems located underground and outside of buildings
EN 1610	Installation and testing of wastewater pipes and sewers	Wastewater construction and testing
EN 12201	PE piping systems for water supply and pressure sewerage	Water supply and pressure sewer systems
DIN 18300	Technical rules for earthworks, soil/rock classification, excavation requirements	Earthworks, trenching, pipe bedding
DWA-A 139	National rules for installation & testing of wastewater pipelines (supplement to EN 1610)	Sewer construction, quality assurance
DVS 2207	Welding procedures for PE pipes (butt, socket, electrofusion)	PE pipe welding for water, gas, wastewater
ISO 12176	Requirements for equipment used for PE welding	Quality assurance of welding equipment
DVS 2202	Evaluation of welded joints, defect classification, acceptance criteria	Inspection & quality control of PE welds
DIN EN 1917	Requirements for concrete inspection chambers	Sewer manholes, access structures
DIN EN 818	Requirements and characteristics of short-link round steel chains used for lifting purposes and as sling chains,	Lifting of filter cartridges

1.6 Notes on reading this manual

Symbols

Symbol	Meaning
•	Listed in no particular order
►	Call for action: here, something has to be done
1.	Call for action in a pre-defined order: here, something has to be done in the specified order

Abbreviations

Abbreviation	Indication
GF	Georg Fischer

2 Safety Information

2.1 Purpose of safety information

Safety information warns of hazards that could lead to bodily injury and damage to property. Always observe and follow safety instructions to prevent accidents and injuries from occurring.

The safety instructions apply to the use of the product as described under "Intended use" (see page 9).

The safety instructions do not cover the following:

- Incidental events occurring during installation, operation and service
- Local and site-related safety regulations

2.2 Meaning of signal words

In this installation and maintenance manual, warnings are used, which warn the user of death, injuries or material damage. Always read and observe these warnings!



DANGER!

Imminent danger!

Non-observance may result in major injuries or death.

- Measures to avoid the danger.



WARNING!

Possible danger!

Non-observance may result in serious injuries.

- Measures to avoid the danger.



CAUTION!

Dangerous situation!

Non-observance may result in minor injuries.

- Measures to avoid the danger.

NOTICE!

Avoid the situation!

Non-observance may result in property damage.

2.3 Intended use

The GF treatment solutions are used to purify stormwater by removing a wide range of contaminants: waste, particles, oil, microplastics, etc. The typical fields of application are treating rainwater from the drainage of streets and car parks, in the treatment of technological sewage from machinery industry plants, gas stations, manual and automatic car washes, repair workshops, etc.

GF Industry and Infrastructure Flow Solutions accepts no liability for damage resulting from incorrect handling of the product and product components (see page 10).

Use is only considered intended if the operator observes the following:

- Use the product as described in the operating instructions
- Use within the limits specified in the technical data
- Only qualified and trained personnel carry out all activities
- Keep persons who are not working on the product at a safe distance from hazardous and operating areas
- Use spare and wear parts that comply with original part specifications
- Replace wear parts within the specified intervals

2.4 Reasonably foreseeable misuse

Any use other than that described for the intended use is not in accordance with the intended use and is therefore not permitted.

The following actions are considered misuse:

- Any use above and beyond intended use
- Alterations or modifications without the knowledge and consent of GF Industry and Infrastructure Flow Solutions
- Circumventing or removing protective equipment and safety measures
- Installing or using unsuitable products in safety-relevant applications

GF Industry and Infrastructure Flow Solutions accepts no liability for damage resulting from improper use. The risks associated with improper use are the sole responsibility of the user.

2.5 Obligations of the operator

The operator undertakes to implement measures arising from content in the technical documentation. This includes in particular:

- Ensuring compliance with laws and regulations currently applicable at the site
- Clearly marking hazardous areas
- Training and instructing personnel
- Providing personal protective equipment
- Enforcing prohibitions and mandatory requirements
- Ensuring devices to secure the shut-off elements are fitted
- Ensuring signs warning against uncontrolled reactivation are provided

2.6 Personnel requirements

Personnel who carry out installation, operation and maintenance are subject to strict requirements.



WARNING!

Injury because of insufficient personnel qualification!

Danger of injury when unqualified personnel carry out installation, operation and maintenance.

- Only qualified personnel carry out all work.

NOTICE!

Property damage because of insufficient personnel qualification!

Danger of property damage when unqualified personnel carry out installation, operation and maintenance.

- Only qualified personnel carry out all work.

This installation and maintenance manual assigns activities to the following personnel:

- Installation personnel
- Operating personnel
- Maintenance personnel
- GF personnel

Only persons who meet the following requirements are authorized as personnel:

- They are qualified within the required field (e.g. welding, piping construction, loading). The customer is responsible that the qualifications are sufficient.
- They carry out all work according to currently applicable local standards and regulations.

2.7 Protective equipment

Persons remaining or working in the vicinity of hazardous and operating areas are required to wear general or special personal protective equipment.



WARNING!

Injury due to personal protective equipment not being worn!

Unprotected body parts may be injured.

- Wear the mandatory personal protective equipment.

During installation, operation and maintenance procedures, the following personal protective equipment must be used:



Protective gloves when required by the conditions



Steel toe-cap safety shoes with non-slip soles



Workwear and high-visibility warning clothing



Protective goggles or a face shield when required by the conditions



Safety helmet at constructions sites and in the water compartment



Safety belt in the water compartment

Other personal protective equipment (e.g. respiratory protection) must always be selected according to the task being performed.

2.8 Safety equipment

Safety equipment can be installed in the product. Contact your local GF representative to customize your product accordingly.

Examples of safety equipment are:

- emergency stop switches
- level sensors
- limit switches

2.9 Safety and responsibility

- ▶ Only use the product as intended (see page 9).
- ▶ Do not use a damaged or defective product or component.
- ▶ Immediately report any damages or defects to GF Industry and Infrastructure Flow Solutions.
- ▶ Make sure that the piping system has been installed or repaired professionally and that it is inspected regularly.

2.10 General safety information

Observe the installation and maintenance manual

- This installation and maintenance manual is part of the product and an important element within the safety concept.
- Only qualified personnel, who have the required training, knowledge or experience, are allowed to commission, install, operate, maintain, and disassemble the product.
- ▶ Read and observe the installation and maintenance manual.
- ▶ Provide the installation and maintenance manual to all current and subsequent users of the product.
- ▶ Regularly instruct personnel on all questions regarding the local regulations applying to occupational safety and environmental protection, especially for pressurized pipes.

WARNING!

Injury due to damaged products!

Risk of injury due to the use of defective or damaged products.

- ▶ Do not use a damaged or defective product.
- ▶ Replace any damaged or defective products immediately.

WARNING!

Injury due to hazardous media!

Risk of injury because of hazardous chemicals or solvents.

- ▶ Wear the mandatory personal protective equipment.

CAUTION!

Injury due to product modifications!

Risk of injury due to product modifications or incompatible spare parts.

- ▶ Do not modify the product or its internal and external components.
- ▶ Only use original spare parts from GF Industry and Infrastructure Flow Solutions or approved third-party components.

CAUTION!

Risk of electric shock!

Internal components may carry hazardous voltages that can cause serious injury or death if touched.

- ▶ Before working on wiring or terminals, always ensure the power supply is completely disconnected (zero potential).
- ▶ Installation, handling, and servicing must be performed only by qualified personnel trained in electrical safety and authorized to work on industrial instrumentation.

NOTICE!

Property damage due to product modifications!

Risk of property damage due to product modifications or incompatible spare parts.

- ▶ Do not modify the product or its internal and external components.
- ▶ Only use original spare parts from GF Industry and Infrastructure Flow Solutions or approved third-party components.

NOTICE!

Property damage due to damaged products!

Risk of property damage due to the use of defective or damaged products.

- ▶ Do not modify the product or its internal and external components.
- ▶ Only use original spare parts from GF Industry and Infrastructure Flow Solutions or approved third-party components.

2.11 Residual risks

In spite of structural and control-related measures, there may be residual risks even if the product is used as intended. The following section identifies residual risks that have been determined by GF Industry and Infrastructure Flow Solutions. To minimize residual risks, observe the following points:

- General legal and company safety regulations
- Recognized technical rules for safe and proper practices
- All safety instructions contained in this installation and maintenance manual
- All safety instructions contained in the bought-in part documentation
- All accident prevention regulations currently in effect in the country of installation

WARNING!

Danger of drowning!

High water pressure can pose a risk of personal injury.

- ▶ Close all closing valves when working inside the product.
- ▶ Wear a safety belt when working inside the product.

WARNING!

Danger of suffocation!

Lack of oxygen inside the product can pose a risk of personal injury.

- ▶ Ensure sufficient air ventilation when working inside the product.
- ▶ Install or wear oxygen monitoring sensors.
- ▶ Do not work alone inside the product.

CAUTION!

Danger of falling over!

The inside of the product can still be slippery because of residual water, even if the product was drained or due to a biofilm or grease from equipment after maintenance.

- ▶ Wear safety shoes with non-slip soles.
- ▶ Do not step into residual puddles.

2.12 Product-specific warnings

WARNING!

Injury due to incompatible materials!

Incompatible materials can be attacked by aggressive media, which can cause injuries.

- ▶ Confirm chemical compatibility before use.

WARNING!

Injury due to high pressures!

Excessive pressure can pose a risk of injury.

- ▶ Do not exceed maximum temperature/pressure specifications.

NOTICE!

Property damage due to incompatible materials!

Incompatible materials can be attacked by aggressive media, which can cause property damage.

- ▶ Confirm chemical compatibility before use.

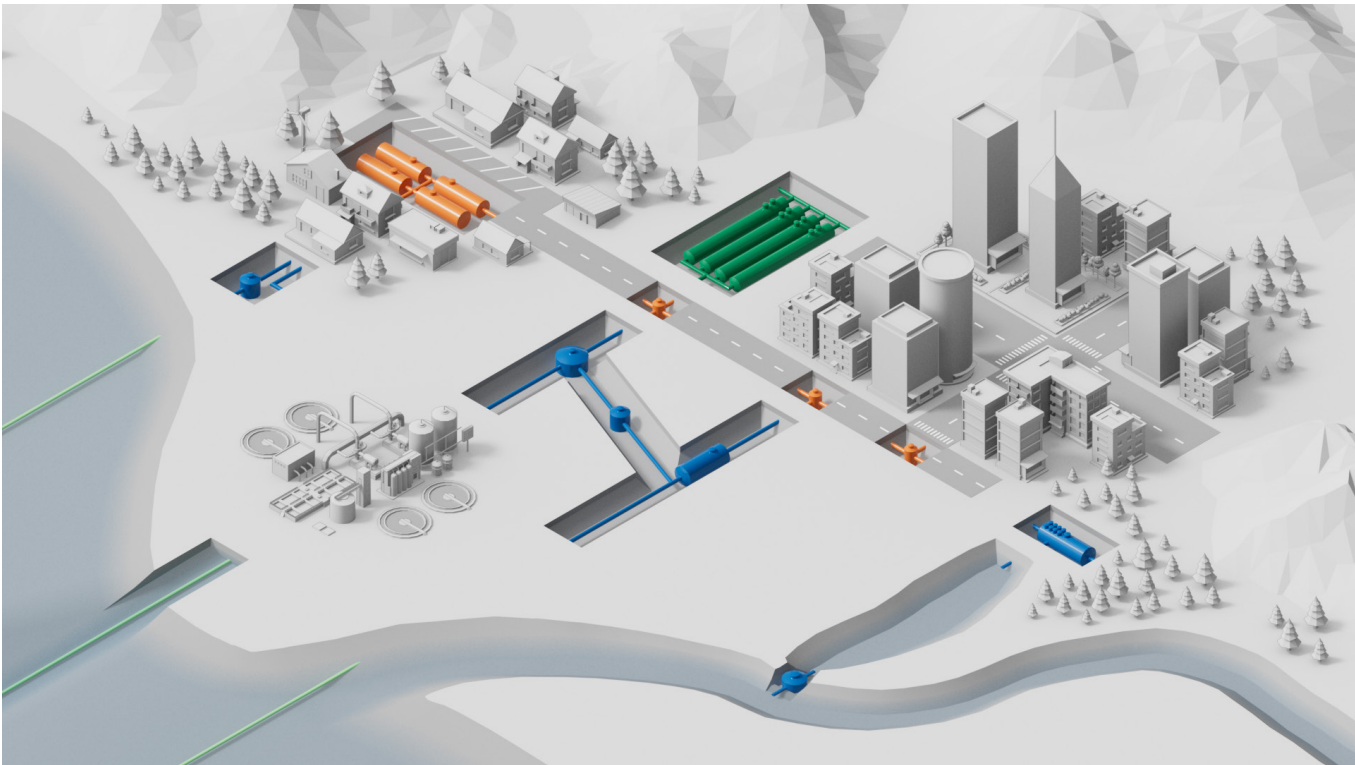
NOTICE!

Property damage due to high pressures!

Excessive pressure can pose a risk of property damage.

- ▶ Do not exceed maximum temperature/pressure specifications.

3 Product description



Color	Designation	Color	Designation
Orange	Retention	Dark green	Harvesting
Blue	Treatment	Light green	Marine outfall

3.1 Functional description

Increased rainfalls and heavier storms have created a higher risk of city floodings. Uncontrolled runoffs can inundate our neighborhoods, create environmental and economical damages and contaminate precious water resources.

GF Stormwise is a complete stormwater management solution that helps urban planners and water network professionals designing sustainable projects to prevent flooding and pollution of water sources.

GF Stormwise provides a wide range of innovative products for stormwater handling and treatment including water reservoirs, flow regulation units, and water purification chambers.

GF Stormwise comprises the following functional entities:

Retention

Retention solutions help storing and delaying stormwater in reservoirs near the source, before forwarding the water into the municipal network, preventing capacity overload. Flow regulation managed safely keeps the size of the retention at an optimal and cost-efficient volume. Sustainability: efficient protection against floods that cause environmental and economic damage. The Stormwise retention tank is described in a separate installation and maintenance manual.

Treatment

Pollution from traffic, buildings, material and other operations are accumulated on the ground in dry periods. In a thunderstorm, pollutants are washed off the ground and follow the stormwater system into the water bodies. Treatment solutions purify stormwater by removing a wide range of contaminants: waste, particles, oil, microplastics, etc. Sustainability: reducing pollutant concentrations and improving the status of water bodies. The products for treatment are described in this installation and maintenance manual.

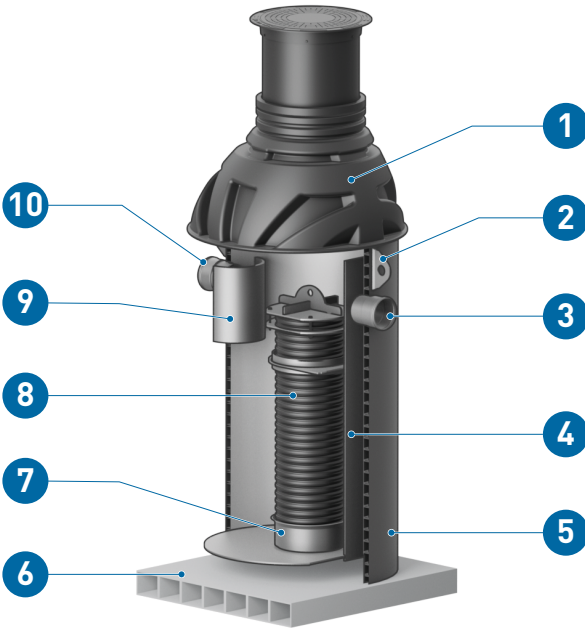
Harvesting

Harvesting is collecting and reusing stormwater for irrigation, flushing toilets or other usage where drinking water is not needed. Sustainability: using stormwater contributes positively to the reuse of resources for the local benefit. The Stormwise harvesting tank is described in a separate installation and maintenance manual.

Marine outfall

Marine outfall pipes efficiently discharge collected and purified stormwater from large paved areas such as city centers and commercial areas into nearby waterbodies. Sustainability: secures safe runoff and protects the constructed environment from floodings. The products for marine outfall are described in a separate manual.

3.1.1 Stormwise Filter Chamber



Pos.	Designation	Pos.	Designation
1	Filter chamber top	6	Self-anchoring base plate
2	Lifting yoke	7	Filter base
3	Outlet	8	Filter cartridge
4	Separating wall	9	Inlet deflector
5	Body	10	Inlet

The GF Stormwise filter chamber filters heavy metals, bacteria, phosphorus, oil, and particles from stormwater. The filter chamber is used in places where cleaning requirements are high, such as parking lots, busy road sections and factory areas. Stormwater is treated by both sedimentation and filtration. Heavier pollutants settle at the bottom of the chamber, and the filter removes finely dispersed contaminants from the effluent water.

A filter chamber is used if a low water flow is expected and a high level of purification is needed.

Characteristics:

- Dimensioned to handle a 10-year rain fall as the maximum flow with a functional flow of 20% to treat at least 95% of the yearly volume
- Designed for an area up to 2 ha
- Connection dimensions from 160 - 500 mm
- Fulfils DWA-A 102-2 category III (tested at IKT, Germany)
- Requires low maintenance:
 - Emptying and cleaning once a year
 - Filter replacement every 2–5 years, depending on the pollution load

Customizable components:

- Chamber size
- Chamber top
- Riser height

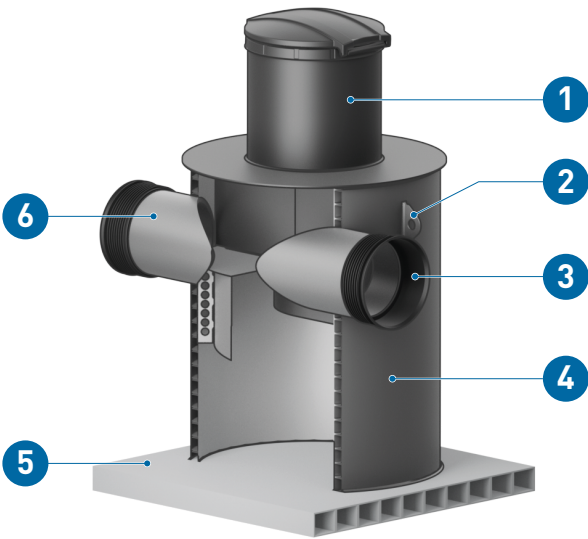
The following table shows a selection of possible filter chamber tops. Customization is possible.

Chamber top variants				
Type A	Type B	Type C	Type D	Type E
ø860/800 With safety gate	600x600 metal 800x800 metal	ø600 GE 40tn ø630 GE 40tn	ø630 GE 40tn ø800 GE 40tn	ø600 no lid ø800 no lid ø1000 no lid
				

Optional components:

- Alarm system ASA-02

3.1.2 Stormwise Vortex



Pos.	Designation	Pos.	Designation
1	Vortex top	4	Body
2	Lifting yoke	5	Self-anchoring base plate
3	Inlet	6	Outlet

The GF Stormwise Vortex is used to purify stormwater from coarse dirt. The Vortex can be used as a stand-alone solution or as a pre-treatment unit upstream of the following systems:

- ponds and wetlands
- filter chambers
- infiltration and retention systems

One chamber both separates sinking particles as well as floating debris and oil.

A Vortex is used if a high water flow is expected and a moderate level of purification is needed.

Characteristics:

- Efficiently collects solids and floating impurities
- Prevents pollutants from entering water bodies
- Reduces maintenance requirements for natural stormwater treatment systems
- Features a simple design and requires low maintenance
- Connection dimensions from 400 - 1200 mm
- Dimensioned for an area up to 10 ha

Customizable components:

- Chamber size
- Chamber top
- Riser height

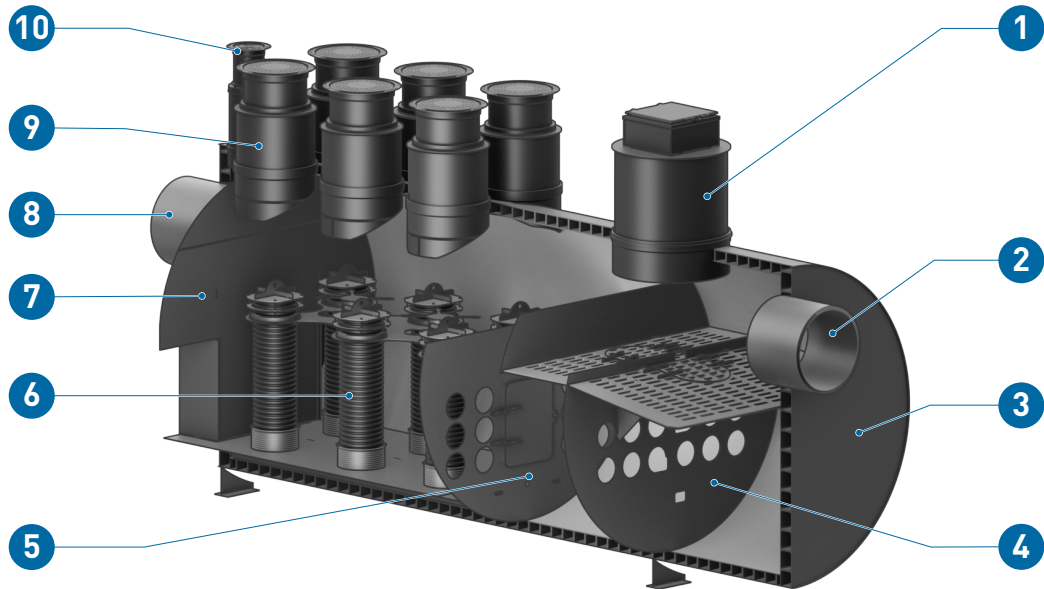
The following table shows a selection of possible Vortex tops. Customization is possible.

Chamber top variants				
Type A	Type B	Type C	Type D	Type E
ø860/800 With safety gate	600x600 metal 800x800 metal	ø600 GE 40tn ø630 GE 40tn	ø630 GE 40tn ø800 GE 40tn	ø600 no lid ø800 no lid ø1000 no lid
				

Optional components:

- Alarm system ASA-02

3.1.3 Stormwise Vault



Pos.	Designation	Pos.	Designation
1	Manhole riser	6	Array of filter cartridges
2	Inlet	7	Separating wall
3	Body	8	Outlet
4	Waste grid (optional)	9	Service riser for filter exchange
5	Flow equalization plate with service door	10	Inspection riser

The Stormwise Vault is used for an extensive purification of high amounts of highly contaminated stormwater. Floating debris, plant parts and other large particles accumulate in the pre-treatment section. The second section contains an array of filter cartridges for the removal of smaller sediments and heavy metals.

A Vault is used if a high water flow is expected and a high level of purification is needed.

Characteristics:

- Dimensioned for an area up to 10 ha. The coverage of a larger area is possible with an external bypass.
- Connection dimensions from 300 - 1200 mm
- Requires low maintenance:
 - Emptying and cleaning at least once a year or when needed
 - Filter replacement every 2 – 5 years, depending on the pollution load

Customizable components:

- Chamber size
- Riser height
- Riser type and top

The following table shows a selection of possible Vault riser tops. Customization is possible.

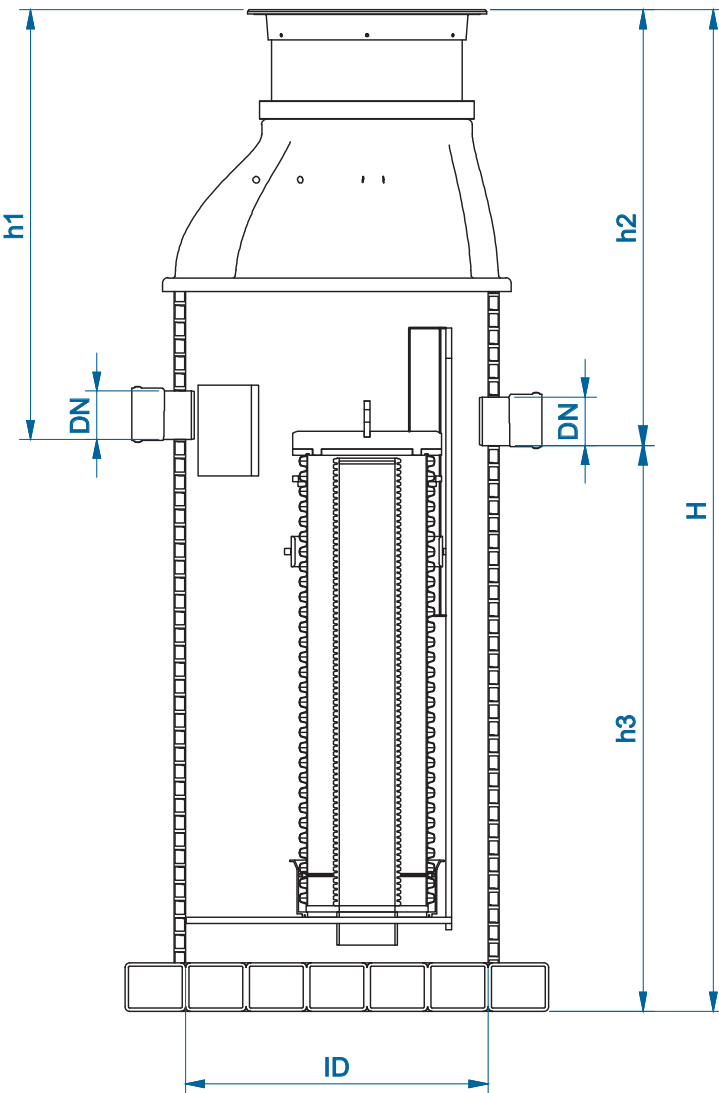
Riser top variants				
Type A	Type B	Type C	Type D	Type E
ø860/800 With safety gate	600x600 metal 800x800 metal	ø600 GE 40tn ø630 GE 40tn	ø630 GE 40tn ø800 GE 40tn ø315 GE 40tn ø160 GE 40tn	ø600 no lid ø800 no lid ø1000 no lid
				

Optional components:

- Waste grid
- Alarm system ASA-02

3.2 Technical data

3.2.1 Stormwise Filter Chamber



Technical data	
Application	Purification of stormwater
Material	PE 100
Inner diameter	1000 - 2400 mm
Height	2865 - 4030 mm
Connection diameter	160 - 500 mm
Color	Black (outside), white (inside)
Filter size	1.5 m or 2.0 m
Functional flow rate	5 - 60 l/s
Maximum flow rate	25 - 300 l/s
Chamber top variants	Type A: Ø 860/800, with safety gate Type B: 600x600/800x800, metal Type C: Ø600/630, GE 40tn Type D: Ø630/800, GE 40tn Type E: Ø600/800/1000, no lid
Standards	DWA-A 102-2 category III
Approvals	IKT seal

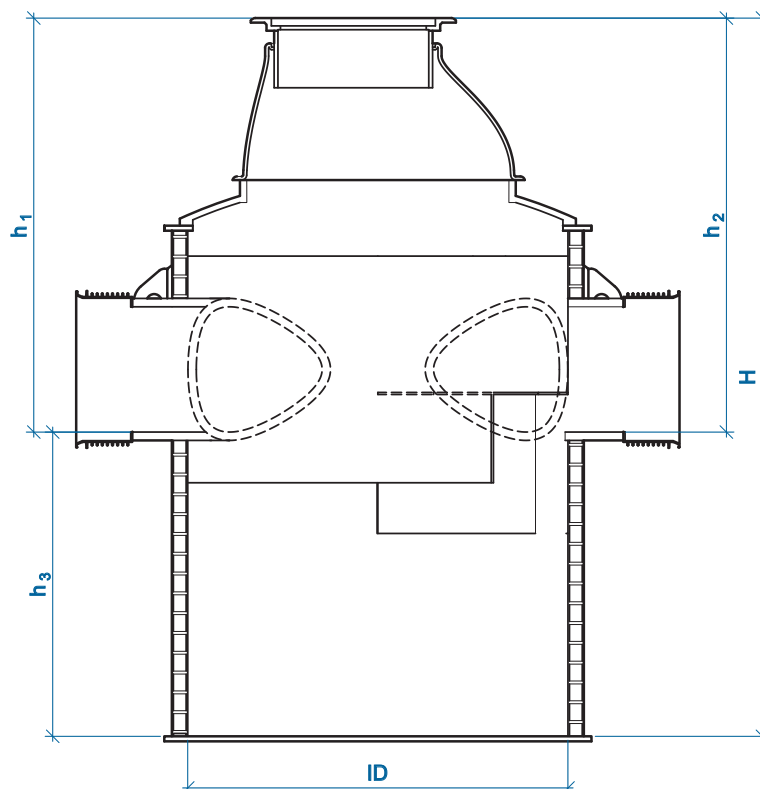
Dimensions and working parameters

Model	Inner diameter ID [mm]	Height H [mm]	Weight [kg]	Connection diameter DN [mm]	Functional flow rate [l/s]	Maximum flow rate [l/s]	Filter
160	1000	2865	350	160	5	25	1 x 1.5 m
200	1200	3245	480	200	10	50	1 x 1.5 m
250	1400	3665	690	250	15	75	1 x 2.0 m
315	1600	3155	860	315	20	100	2 x 1.5 m
400	1600	3815	1000	400	30	150	2 x 2.0 m
400	2400	3510	1800	400	40	200	4 x 1.5 m
500	2400	4030	2030	500	60	300	4 x 1.5 m

Custom dimensions

Model	Inlet position below ground level h1 [mm]	Outlet position below ground level h2 [mm]	Outlet position above base h3 [mm]
160	≥1040	≥1040	≥1825
200	≥1335	≥1335	≥1910
250	≥1230	≥1230	≥2435
315	≥1245	≥1245	≥1910
400	≥1380	≥1380	≥2435
400	≥1600	≥1600	≥1910
500	≥1600	≥1600	≥2430

3.2.2 Stormwise Vortex



Technical data

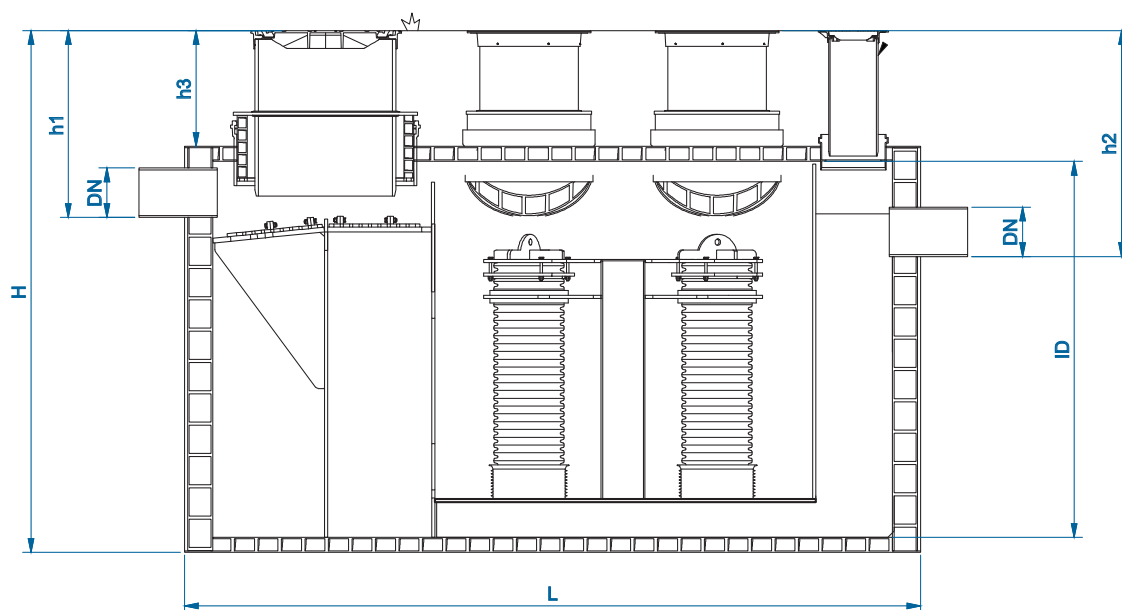
Application	Purification of stormwater
Material	PE 100
Inner diameter	1200 - 3500 mm
Height	2850 - 3660 mm
Connection diameter	400 - 1200 mm
Color	Black (outside), white (inside)
Functional flow rate	30 - 600 l/s
Maximum flow rate	160 - 3000 l/s
Chamber top variants	Type A: Ø 860/800, with safety gate Type B: 600x600/800x800, metal Type C: Ø600/630, GE 40tn Type D: Ø630/800, GE 40tn Type E: Ø600/800/1000, no lid
Standard	DWA-A 102-2
Approvals	IKT seal pending

Dimensions and working parameters

Model	Inner diameter ID [mm]	Height H [mm]	Weight [kg]	Connection diameter DN [mm]	Functional flow rate [l/s]	Maximum flow rate [l/s]	Sediment volume [l]	Oil volume [l]
1200	1200	1900	350	400	30	160	352	133
1500	1500	2000	480	500	60	300	550	432
1800	1800	2100	690	600	100	500	792	631
2400	2400	2550	860	800	200	1000	1407	1106
3000	3000	2650	1000	1000	360	1800	2199	1825
3500	3500	2850	1800	1200	600	3000	3167	2846

Custom dimensions			
Model	Inlet position below ground level h1 [mm]	Outlet position below ground level h2 [mm]	Inlet position above base h3 [mm]
1200	≥700	≥700	≥1200
1500	≥800	≥800	≥1200
1800	≥900	≥900	≥1200
2400	≥1350	≥1350	≥1200
3000	≥1450	≥1450	≥1200
3500	≥1650	≥1650	≥1200

3.2.3 Stormwise Vault



Technical data

Application	Purification of stormwater
Material	PE 100
Inner diameter	2400 - 3500 mm
Length	4000 - 18000 mm
Connection diameter	300 - 1200 mm
Color	Black (outside), white (inside)
Filter size	1.5 m
Functional flow rate	7.5 - 300 l/s
Maximum flow rate	75 - 3000 l/s
Riser top variants	Type A: Ø860/800, with safety gate Type B: 600x600/800x800, metal Type C: Ø600/630, GE 40tn Type D: Ø630/800/315/160, GE 40tn Type E: Ø600/800/1000, no lid
Standard	DWA-A 102-2 category III
Approvals	IKT seal

Dimensions

Model	Inner diameter ID [mm]	Length L [mm]	Connection diameter DN [mm]	Weight [kg]
300	2400	4000	300	2040
400	2400	5000	400	2280
500	3000	4000	500	3320
600	3000	6000	600	4170
800	3000	8000	800	5230
1000	3500	12000	1000	9880
1200	3500	18000	1200	13980

Custom dimensions

h1	Inlet position below ground level
h2	Outlet position below ground level
h3	Body position below ground level

Working parameters

Model	Catchment volume [m³]	Functional flow rate [l/s]	Maximum flow rate [l/s]	Retention time over filter [s]	Filter
300	750	7.5	75	38	2 x 1.5 m
400	1500	15	150	19	2 x 1.5 m
500	3000	30	300	19	4 x 1.5 m
600	5000	50	500	17	4 x 1.5 m
800	10000	100	1000	8	6 x 1.5 m
1000	18000	180	1800	9	12 x 1.5 m
1200	30000	300	3000	8	16 x 2 m

4 Transport and storage

4.1 Safety instructions

- ▶ Only properly trained personnel carry out all loading and unloading work.
- ▶ Ensure that the personnel performing the work wear appropriate personal protective equipment.
- ▶ Ensure that the personnel performing the work are trained in health and safety.

NOTICE!

Risk of property damage!

Non-observance of guidelines can cause property damage.

- ▶ Observe the guidelines below for loading and unloading, transporting and storage.

The treatment unit must be handled, transported and stored with care. Note the following points:

- The treatment unit and its components must not be damaged either by mechanical or thermal influences.
- The machinery and equipment used for handling the treatment unit must be technically flawless and adapted to the type of cargo.
- ▶ Transport and store the treatment unit in its original packing.
- ▶ Protect the treatment unit from harmful physical influences.
- ▶ Avoid contact of the treatment unit with chemicals, gasoline, or diesel fuel.
- ▶ Avoid handling and transporting the treatment unit at air temperatures below -20 °C.

4.2 Loading and unloading



DANGER!

Risk of injury due to suspended loads!

Falling suspended loads can cause serious or fatal injuries.

- ▶ Never stand or walk under suspended loads.

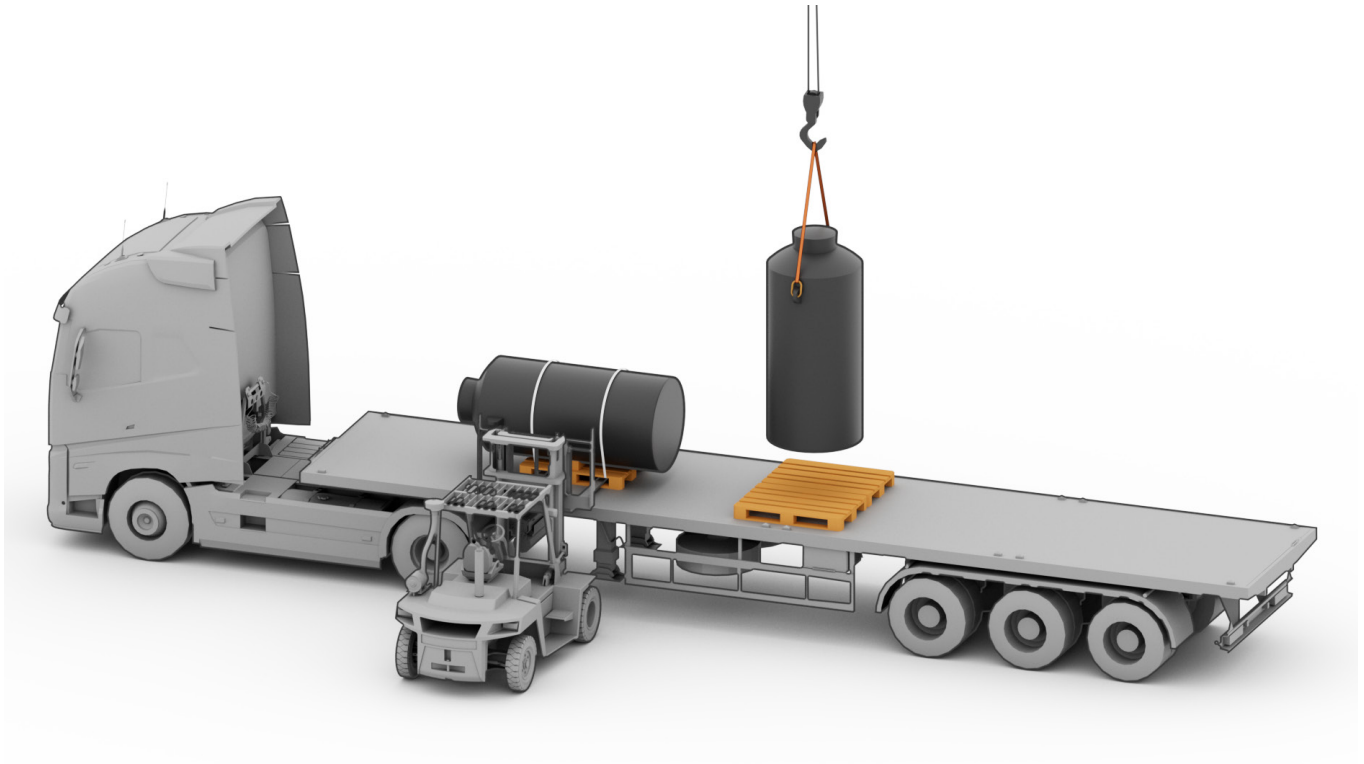
NOTICE!

Product damage while lifting!

It is important to make sure that the lift belts do not damage any protruding parts.

- ▶ Always lift the treatment unit with a crane.
- ▶ Ensure availability of unloading equipment on the construction site.
- ▶ Before unloading, ensure that the treatment unit is undamaged. Record any claims or complaints directly with the driver on the delivery documents.
- ▶ For loading and unloading, only use approved, checked and intact gear and equipment.
- ▶ Only use lifting belts and hanging loops made of soft materials, e.g. nylon.
- ▶ Do not use cables, wires or chains that might scratch or harm the surface of the treatment unit.
- ▶ Ensure that the lifting gear can handle the weight of the load.
- ▶ Ensure that the lifting belts do not damage any protruding parts.
- ▶ Do not slide the treatment unit.
- ▶ Do not unload by tipping.
- ▶ Avoid sudden stress. This applies in particular at ambient temperatures below -20 °C, as the impact strength of plastics is significantly reduced at these temperatures.

4.2.1 Loading and unloading the Filter Chamber and Vortex

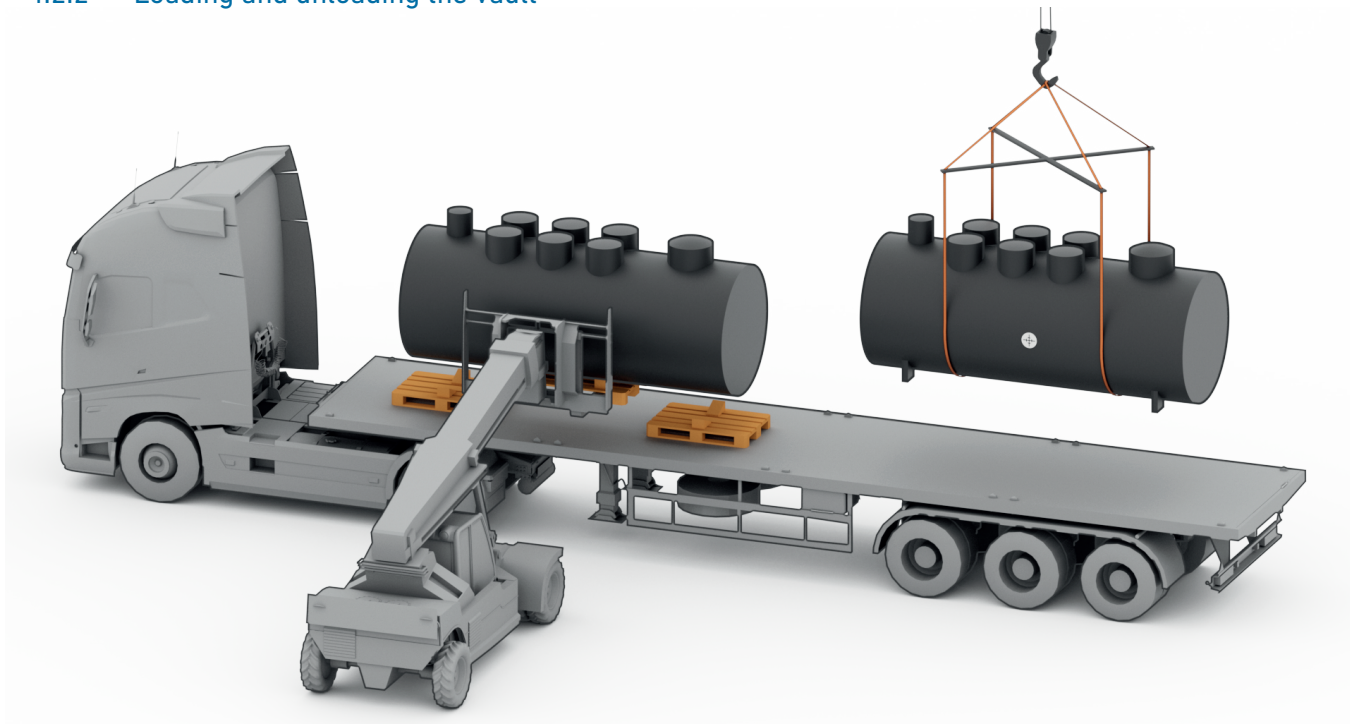


- Use a forklift or a crane for loading and unloading the filter chamber or the Vortex.

Loading and unloading with a crane:

- Attach the lifting belts to the lifting yokes at the side of the body.
- If possible, use a spreader bar.
- Protect the lifting straps with corner guards.

4.2.2 Loading and unloading the Vault



- Use a forklift or a crane for loading and unloading the Vault.

Loading and unloading with a crane:

- If possible, use a spreader bar for lifting the Vault.
- Do not place the lifting belts around the inlets or outlets.
- Consider using guidance ropes around the inlets or outlets in order to keep the Vault stable.
- Ensure that the lifting straps never touch the risers or the inlets or outlets.

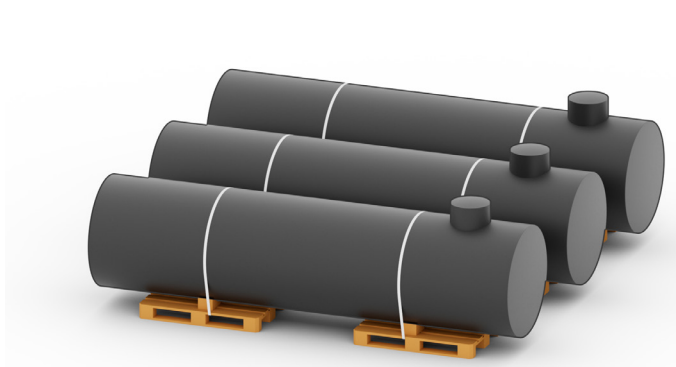
4.3 Transporting



- Ensure access to the construction site for the logistics company.
- Ensure proper preparation of the access route to accommodate trucks. Take into account the trucks' size and weight.
- Use a transportation platform, which is clean, flat and without any pointy or sharp objects.
- Transport the filter chamber and the Vortex vertically or horizontally, depending on the model size.
- Transport the Vault horizontally.
- Do not slide the treatment unit.

- ▶ Place the product on the platform so that any protruding elements are protected from damage.
- ▶ Support the product with wooden wedges or pallets to prevent any movement.
- ▶ Use wide cargo straps to secure the load.
- ▶ Do not use cables, wires or chains to secure the load.
- ▶ Avoid contact of belt buckles and the product, e.g. by using rubber pads.
- ▶ Cover all openings to prevent dirt from entering the treatment unit.

4.4 Storing



- ▶ Choose a clean and even storage site.
- ▶ Store the treatment unit in its original packing.
- ▶ Store the filter chamber and the Vortex vertically or horizontally.
- ▶ Store the Vault horizontally.
- ▶ Do not stack the treatment unit.
- ▶ Store the treatment unit on wooden racks or pallets.
- ▶ Avoid contact of the treatment unit with the ground.
- ▶ Ensure that there are no sharp objects like nails or stones on the racks or pallets.
- ▶ Carefully inspect the treatment unit at the time of delivery and notify and report any defects immediately.

5 Installation

5.1 Safety instructions

DANGER!

Injury due to manipulations on pressurized pipes!

Improper manipulations on a pressurized pipe can lead to the medium escaping under pressure, resulting in injuries.

- ▶ Always consult the installation and maintenance manual before making any manipulations to pipes.
- ▶ Under all circumstances, make modifications to pressurized pipes only according to the instructions in this installation and maintenance manual.

DANGER!

Injury due to damaged cabling!

Touching damaged cables may lead to electrical shocks or death.

- ▶ Operate the treatment unit only if the cables are undamaged and it has been installed correctly.

WARNING!

Injury because of insufficient personnel qualification!

Danger of injury when unqualified personnel carry out installation, operation and maintenance.

- ▶ Only qualified personnel carry out all work.

NOTICE!

Property damage due to manipulations on pressurized pipes!

Improper manipulations on a pressurized pipe can lead to the medium escaping under pressure, resulting in property damage.

- ▶ Always consult the installation and maintenance manual before making any manipulations to pipes.
- ▶ Under all circumstances, make modifications to pressurized pipes only according to the instructions in this installation and maintenance manual.

NOTICE!

Property damage due to leaking water connections!

Escaping water can lead to flooding of the room and property damage to the building and fittings.

- ▶ Check that there are no leaks.

NOTICE!

Property damage due to incorrect service voltage!

If connected to an incorrect service voltage, the treatment unit can be damaged.

- ▶ Only connect to voltage sources as specified on the treatment unit label.

NOTICE!

Buoyancy due to ground water!

If the treatment unit is installed in an area of high ground water, the treatment unit could be lifted by the groundwater.

- ▶ Use the GF anchoring kit or geotextile fabric to counteract the lifting force.

NOTICE!

Property damage because of insufficient personnel qualification!

Danger of property damage when unqualified personnel carry out installation, operation and maintenance.

- ▶ Only qualified personnel carry out all work.

5.2 Before installation

The customer is responsible for handling the treatment unit and other equipment and installing at the site.

The treatment unit must be installed with care. Note the following points:

- ▶ Strictly follow the requirements from the static calculation. A detailed static calculation can be provided on request.
- ▶ Ensure that any work on-site, including excavation and backfilling, is done in compliance with the respective local regulations. The relevant installation details are defined in DIN EN 1610 and the associated standards and guidelines referenced therein.
- ▶ Check the treatment unit for general damage or flaws prior to installation.
- ▶ Avoid installation of the treatment unit at air temperatures below -20° C.
- ▶ Handle Weholite products as described in currently applicable standards and regulations.

5.2.1 Prerequisites

- The GF Stormwise treatment unit is engineered according to the project-specific customer requirements and is intended for earth-buried applications. The treatment unit is designed to meet static requirements, considering parameters such as installation depth, coverage, traffic loads, groundwater level, hydraulic loads, and more.
- ▶ Conduct all work on-site, including excavation and backfilling, in compliance with the respective local regulations. The relevant installation details are defined in DIN EN 1610 and the associated standards and guidelines referenced therein.
- ▶ Arrange a suitable installation location for the treatment unit in cooperation with local authorities.
- ▶ Arrange and prepare a suitable storage site so that the treatment unit can be placed on an even surface over its whole length.
- ▶ Ensure easy access for transport equipment to the storage and installation site.
- ▶ Arrange suitable and adequate lifting gear on site.
- ▶ Arrange relevant electrical and other connective work (welding etc.).
- ▶ Arrange excavation and fill on site with suitable materials and by suitable methods.
- ▶ When receiving the treatment unit, handle carefully to avoid damage by lifting or other equipment.

5.2.2 Required tools and materials

For the correct installation, the following equipment is required apart from standard tools:

- Proper lifting equipment
- Proper excavation equipment
- Proper tooling for the selected pipe joining method
- Compacting equipment according to local standards and regulations

5.3 Installation procedure (Filter Chamber and Vortex)

5.3.1 Digging the pit

- ▶ Ensure that the excavation is wide enough to allow sufficient working space around the technical treatment unit. Select the specific space around the treatment unit based on installation depth and soil conditions to ensure safe working conditions. Ensure that there is enough space around the treatment unit installed in the pit to compact the backfill material.
- ▶ In case of anchoring, take also into account the dimensions of the anchoring equipment.
- ▶ If the soil consists of poorly draining material, such as clay, it is recommended to install drainage in the excavation.
- ▶ Ensure that the bottom and walls of the pit are free of stones, bricks, debris, and other objects that may cause mechanical damage to the treatment unit.
- ▶ Ensure that the bottom of the pit is completely solid and even, as gaps may form in soft areas and unevenness under the treatment unit when the pit is filled.
- ▶ In road areas or areas immediately adjacent to road areas, ensure that the pit is designed and constructed to avoid undermining and settlement.
- ▶ Dig the pit to the correct depth taking traffic load conditions into consideration. Minimum top fill is 30 cm in green areas. See chapter 5.3.11 for the minimum top fill in traffic areas.

5.3.2 Preparing the bottom layer

- ▶ Ensure that the excavation base provides at least the same load-bearing capacity as the undisturbed native soil.
 - ▶ If the base has been loosened during excavation, ensure that its original bearing capacity is restored using appropriate compaction equipment.
 - ▶ Keep the pit bottom free of water during compaction.
 - The treatment unit is placed on a bottom layer that eliminates unevenness and ensures that the treatment unit receives uniform and even support. The thickness of the bottom layer depends on the type of treatment unit and the connection pipes. The connection pipes must be able to be dug into the bottom layer so that the treatment unit receives linear support.
1. Prepare the bottom of the pit according to EN 1610. In addition to the minimum thickness, the standard also defines requirements for the bedding materials to be used.
 2. Make sure that the floor is level.

5.3.3 Ground water

The treatment unit body is self-anchoring, so there's usually no need for extra precautions against ground water's buoyancy forces.

- ▶ If the ground on site is poorly permeable by water (for example clay), take installing draining into the pit into consideration.
- ▶ Ensure that the eventual height difference between ground level and maintenance lids is at least 200 mm. The treatment unit height is the distance between the outlet flow line and the ground level.
- ▶ If the treatment unit is placed in an area where high ground water level is present, prepare bottom of excavation according to possible anchoring arrangements.

5.3.4 Lifting and positioning the Treatment Unit



DANGER!

Risk of injury due to suspended loads!

Falling suspended loads can cause serious or fatal injuries.

- ▶ Never stand or walk under suspended loads.

NOTICE!

Property damage because of objects in the pit!

Stones, bricks, debris, and other objects can damage the bottom and walls of the treatment unit.

- ▶ Ensure that the bottom and walls of the pit are free of stones, bricks, debris, and other objects.
 - ▶ Carry out treatment unit lifting by using lifting belts attached onto the treatment unit, following the instructions for loading and unloading (see page 25).
 - ▶ Prevent the stressing of (welded) connections and other structural parts.
1. Place the treatment unit on the bottom layer.
 2. Level the treatment unit. The basis for the proper functioning of the treatment unit is its proper leveling.
 3. Make sure that the connections are at the correct height.
 4. Remove any temporary supports used during transport after the treatment unit is in its required position and adequately supported.

5.3.5 Anti-buoyancy in groundwater conditions

- Usually, the treatment unit is equipped with a self-anchoring bottom. In that case, no further anchoring is necessary (see image):



- If the treatment unit is not equipped with a self-anchoring plate, use the GF anchoring kit (see image):



- ▶ Wrap the anchoring straps around the lifting yokes.
- ▶ Choose the number of anchoring plates according to treatment unit size/buoyancy.
- ▶ Choose the size of the concrete slab so that it overrides the buoyancy and has enough space for fixtures of a proper number of straps.

As a standard solution, the steel reinforced concrete slab dimensions are calculated like the following: thickness 150 mm x treatment unit width +200 mm X treatment unit length +200 mm. This still depends on the site conditions and a designer needs to check and approve or update the solution and slab dimensions.

5.3.6 Connecting the inlet and outlet pipes

WARNING!

Risk of electrical shock!

Ensure that there is no water in the pipeline when doing electric welding.

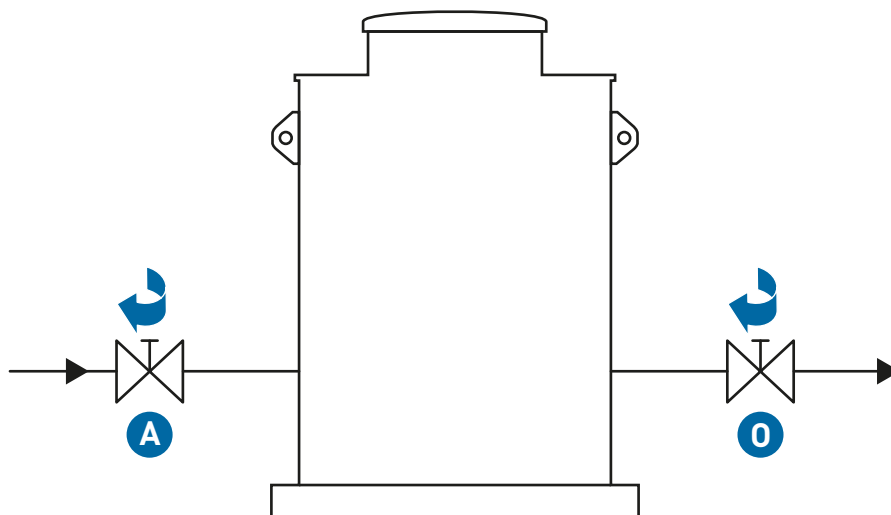
- ▶ Make mechanical connections according to GF installation guidelines and currently applicable standards and regulations.
- ▶ Only use approved materials and fittings.
- ▶ Do electric welding according to GF installation guidelines and currently applicable standards and regulations.
- ▶ Avoid applying excessive force or torque to the treatment unit body, pipe joints, or seals.
- ▶ Ensure proper installation to uphold system integrity and warranty coverage.
- ▶ Always follow local regulations and component manuals during installation.

NOTICE!

Risk of leakage or structural damage!

Incorrect connection or misalignment of the treatment unit may lead to leaks, mechanical stress, or system failure.

- ▶ Make sure that the inlet and outlet shut-off valves (A and O) are fully closed.



- ▶ Only qualified personnel carry out all work.
 - ▶ Ensure proper alignment of all inlet and outlet connections before the final installation.
 - ▶ Only use approved materials and fittings.
 - ▶ Avoid applying excessive force or torque to the treatment unit body, pipe joints, or seals.
 - ▶ Always follow local regulations during installation.
- Connection of inlet and outlet can be made by welding, flange connections, or with mechanical fittings.
 - ▶ Ensure that the installation follows the instructions from connector's manufacturer or complies with applicable local rules or standards such as DVS 2207.

The ground frost insulation and/or thermal insulation of pipes can be carried out if needed according to the respective plan and in compliance with currently applicable standards and regulations. The final landscaping is to be completed by the customer. The customer may consider preparing for exceptional circumstances, such as a power outage, with a spare power source and/or –connection. Components and equipment must be monitored and inspected according to the suppliers' standards and recommendations.

5.3.7 Connecting electrical connections

WARNING!

Risk of electrical shock!

Failure to follow instructions may result in serious injury or electric shock.

- ▶ Follow the currently applicable standards and regulations for connecting electrical connections.
- ▶ Electrical enclosures must only be opened or operated by qualified personnel.
- ▶ Exceptions apply only to non-locked cabinets, which may be accessed as permitted by company safety regulations.
- ▶ Make mechanical connections (e.g. flange connections) according to GF installation guidelines and currently applicable standards and regulations and use approved materials and fittings.
- ▶ Monitor the condition of the electric devices before starting any installations.
- ▶ Ensure proper installation to uphold system integrity and warranty coverage.
- ▶ Always follow local regulations and component manuals during installation.
- ▶ Route cables exclusively through the designated cable passings.
- ▶ Ensure that the cable inlet is sealed properly and watertight.

5.3.8 Testing and inspecting

WARNING!

Risk of injury due to uncontrollable exit of the medium!

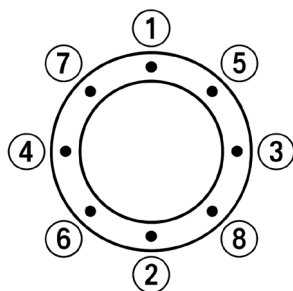
If leaking, the medium may exit uncontrollably.

- ▶ Assume a protected working position.
- ▶ Wear protective clothing, if required.
- Leak testing can be done either with water or air.
- It is recommended to log visual testing and inspecting.
- ▶ Perform a leakage test and inspection according to currently applicable local standards and regulations.
- ▶ Check whether all components inside the treatment unit work properly.
- ▶ Carefully check the piping system for leaks.

5.3.9 Installing the Treatment Unit top

- Depending on the treatment unit top type, installation varies.
- ▶ If a concrete plate and separate cover is used, ensure that the concrete plate distributes all load to surrounding ground.
- ▶ The treatment unit top solution and cover are selected based on the pipe diameter. All traffic loads are transferred through the treatment unit top cover and structure into the surrounding soil. This transfer ensures that no load is imposed on the treatment unit itself.
- ▶ If applicable, install a smooth treatment unit top:
 1. Align the treatment unit top pipe axially to the treatment unit top connector.
 2. Lubricate the gasket of the pipe socket.
 3. Lubricate the outer surface of the spigot.
 4. Slowly push the socket onto the spigot to the depth specified by the pipe manufacturer.
 5. Move the treatment unit top pipe in different directions to make the gasket align.
- ▶ If applicable, install a corrugated treatment unit top:
 1. Install the rubber seal into the lowest groove of the treatment unit top pipe. Make sure the single lip faces outwards.
 2. Lubricate the rubber seal.
 3. Lubricate the inner surface of the treatment unit top connector.
 4. Push the treatment unit top into the treatment unit top connector.

- If applicable, install a treatment unit top with a flange connection:
 1. Install the seal ring into the uppermost groove.
 2. Apply lubricant to the tip end of the treatment unit top pipe and install it internally in the well pipe.
 3. Fill up and pack to the desired level.
 4. Tighten the bolts. The recommended order of bolt tightening is as in the picture.



5. Perform the first tightening round using a torque that is approximately half of the final tightness.
6. Complete the after-tightening of the bolted connections before disinfecting the treatment unit.
7. Check the tightness of the flanges.
8. Tighten the bolts using a torque wrench.

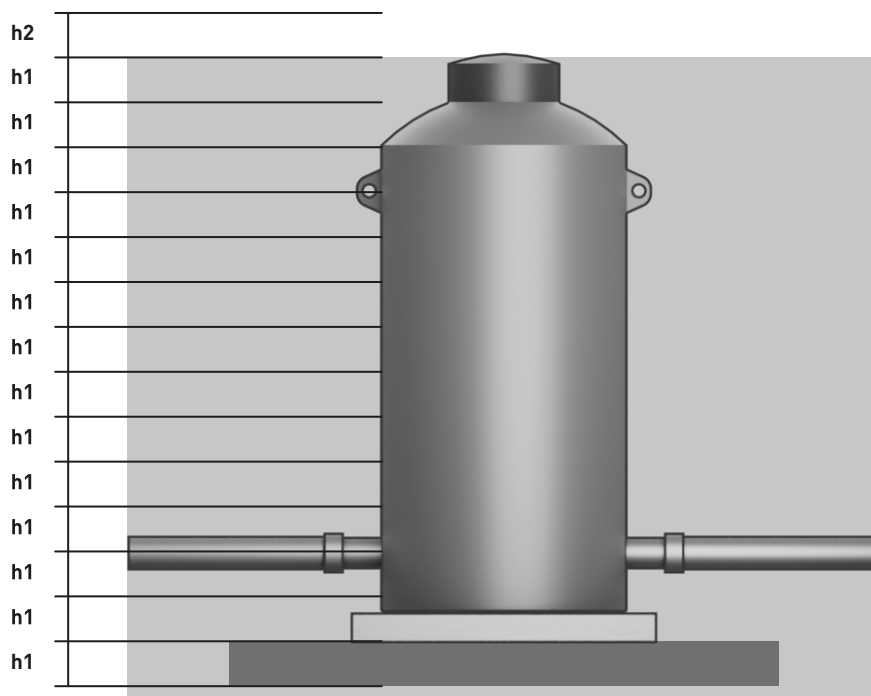
5.3.10 Backfilling around the Treatment Unit

NOTICE!

Risk of material damage!

The use of heavy compaction equipment directly above the treatment unit may damage the treatment unit.

- Do not use mechanical compaction with vibrators directly above the treatment unit or pipes.
- Follow standard EN 1610 in all backfilling steps.
- Ensure that the bedding heights h_1 and h_2 follow the requirements in EN 1610 and other currently applicable local standards and regulations.



Pipe bedding

- ▶ Ensure that the bedding soil is free from stones within the width of the treatment unit pit.
- ▶ Prepare the pit bottom bedding layer according to EN 1610.
- ▶ Compact the bedding layer mechanically.
- ▶ For installation in soft or wet soil, place geotextile under the bedding to keep the bedding and native materials separate.

Primary backfill

- ▶ Ensure that the treatment unit is fully closed.
- ▶ Use backfill material according to EN 1610.
- ▶ Backfill over the whole pit width.
- ▶ Compact the backfill material according to EN 1610.
- ▶ Fill in the final layer of the primary backfill according to EN 1610.
- ▶ Spread the primary backfill material carefully from a low height.
- ▶ Take special care when compacting the haunch area.
- ▶ Ensure that the treatment unit does not move during haunch area compaction.
- ▶ Place the primary backfill in even layers on both sides of the treatment unit.
- ▶ Ensure that the soil material used is not frozen.
- ▶ Ensure the minimum backfill level according to EN 1610 before compacting directly above the treatment unit.

Final backfill

- ▶ Ensure that the final backfill material is free from stones.
- ▶ Ensure that the final backfill material is compactable as dug materials or better.
- ▶ Follow the requirements for non-traffic or traffic areas described in EN 1610.
- ▶ Carry out compaction in several layers.

5.3.11 Installation under a traffic area

The treatment unit can be installed in areas up to load class D400 (according to EN 124). The backfill layer above the treatment unit is used to distribute the loads by pedestrian and vehicle traffic. The minimum total thickness of the backfill layer above the treatment unit (dimension [A]) is displayed in the following table. The stiffness is determined according to ISO 9969.

Load class	Test load	Traffic group description	SN2 [A]	SN4 [A]	SN8 [A]
D	400 kN	Areas where cars and lorries have access, including carriageways, hard shoulders, and pedestrian areas.	-	1.0 m	0.8 m
B	125 kN	Car parks and pedestrian areas where only occasional vehicular access is likely.	-	0.8 m	0.6 m
A	15 kN	Only pedestrians have access.	0.3 m	0.3 m	0.3 m

Shallower installations can be carried out by using a concrete load-bearing construction.

- ▶ Follow local standards and regulations for the minimum cover depth.

NOTE!

If the site situation does not allow the minimum installation depth, and dimension [A] will be less than in the table, there is the possibility to prepare a steel reinforced concrete slab above the treatment unit. Landscaping designers must take all aspects of the site into account and define the structure and dimensions of load distribution slab.

5.4 Installation procedure (Vault)

5.4.1 Digging the Vault pit

- The excavation must be wide enough to allow sufficient working space around the Vault.
 - In case of anchoring, take also into account the dimensions of the anchoring equipment.
 - If the soil consists of poorly draining material, such as clay, it is recommended to install drainage in the excavation.
 - The edges of the pit must be sloped with attention to occupational safety. The slope gradient must be 1:5 or gentler.
 - The bottom and walls of the pit must be free of stones, bricks, debris, and other objects that may cause mechanical damage to the Vault.
 - The bottom of the pit must be completely solid and even, as gaps may form in soft areas and unevenness under the Vault when the pit is filled.
 - In road areas or areas immediately adjacent to road areas, the pit must be designed and constructed to avoid undermining and settlement.
- Dig the pit to the correct depth taking traffic load conditions into consideration. Minimum top fill is 30 cm in green areas. See chapter 5.3.11 for the minimum top fill in traffic areas.

5.4.2 Preparing the bottom layer

Ensure that the excavation base provides at least the same load-bearing capacity as the undisturbed native soil.

- If the base has been loosened during excavation, ensure that its original bearing capacity is restored using appropriate compaction equipment.
 - Keep the pit bottom free of water during compaction.
 - The Vault is laid on a bottom layer that eliminates unevenness and ensures that the Vault receives uniform and even support. The thickness of the bottom layer depends on the type of Vault and the connection pipes. The connection pipes must be able to be dug into the bottom layer so that the Vault receives linear support.
1. Prepare the bottom of the pit according to EN 1610. In addition to the minimum thickness, the standard also defines requirements for the bedding materials to be used.
 2. Make sure that the floor is level.

5.4.3 Lifting and positioning the Vault



DANGER!

Risk of injury due to suspended loads!

Falling suspended loads can cause serious or fatal injuries.

- Never stand or walk under suspended loads.

NOTICE!

Property damage because of objects in the pit!

Stones, bricks, debris, and other objects can damage the bottom and walls of the Vault.

- Ensure that the bottom and walls of the pit are free of stones, bricks, debris, and other objects.
 - Carry out Vault lifting using lifting belts attached around the Vault, following the instructions for loading and unloading (see page 25).
 - Prevent the stressing of (welded) connections and other structural parts.
 - In case multiple Vaults are positioned next to each other, maintain the minimum distance specified in the technical drawing to allow proper compaction of the backfill or, where applicable, the installation of geotextile anchoring.
1. Place the Vault on the bottom layer.
 2. Level the Vault. The basis for the proper functioning of the Vault is its proper leveling.
 3. Make sure that the connections are at the correct height.
 4. Remove any temporary supports used during transport after the Vault is in its required position and adequately supported.

5.4.4 Anti-buoyancy in groundwater conditions

The Vault can be anchored to counteract buoyancy caused by groundwater. There are different anchoring options available. GF provides calculations for anchoring and selection of the anchoring technology depending on the project parameters. Possible anchoring methods are:

- A specially designed and dimensioned anchoring kit with belts and anchor slabs



- A geotextile/geogrid anchoring system which is installed over the Vault and lapped up the pit sides, then locked in place by the backfill. Further information can be found in the geotextile manufacturer's installation manuals.



- GF's patented profile filling technology

5.4.5 Connecting the inlet and outlet pipes

CAUTION!

Risk of leakage or structural damage!

Incorrect connection or misalignment of the Vault may lead to leaks, mechanical stress, or system failure.

- ▶ Ensure proper alignment of all inlet and outlet connections before the final installation.
 - ▶ Make connections according to the installation guidelines and use approved materials and fittings.
 - ▶ Avoid applying excessive force or torque to the Vault body, pipe joints, or seals.
 - ▶ Improper installation may compromise system integrity and void warranty coverage.
 - ▶ Always follow local regulations during installation.
 - ▶ Only qualified personnel carry out all work.
-
- Connection of inlet and outlet can be made by welding, flange connections, or with mechanical fittings.
 - ▶ Ensure that the installation follows the instructions from connector's manufacturer or complies with applicable local rules or standards such as DVS 2207.

The ground frost insulation and/or thermal insulation of pipes can be carried out if needed according to the respective plan and in compliance with currently applicable standards and regulations. The final landscaping is to be completed by the customer. The customer may consider preparing for exceptional circumstances, such as a power outage, with a spare power source and/or –connection. Components and equipment must be monitored and inspected according to the suppliers' standards and recommendations.

5.4.6 Testing and inspecting

WARNING!

Risk of injury due to uncontrollable exit of the medium!

If leaking, the medium may exit uncontrollably under high pressure.

- ▶ Assume a protected working position.
- ▶ Wear protective clothing, if required.
- ▶ In case of leaks: close the inlet shut-off valve.

NOTICE!

Danger of material damage in the pipeline system.

When commencing the initial operation via the main pipeline there is the danger that the initial pressure is too high and the pipeline system is damaged.

- ▶ Follow the defined order.

If applicable, perform a leak and tightness test before any backfilling. Follow EN 1610 for any leak and tightness tests.

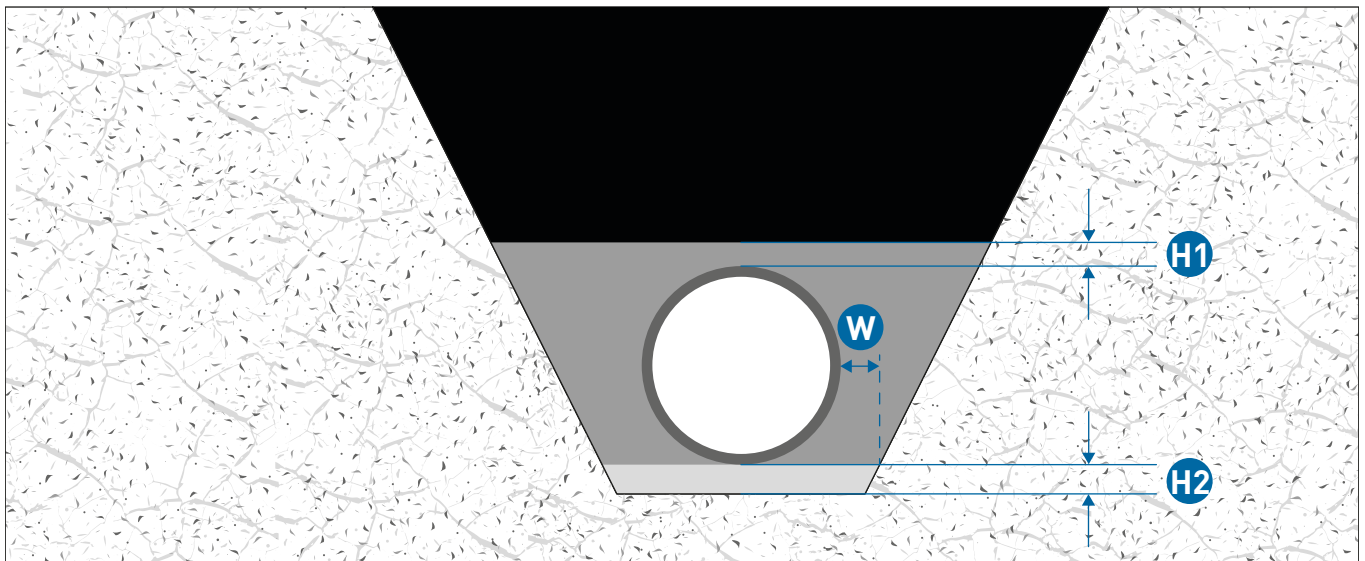
5.4.7 Backfilling around the Vault

NOTICE!

Risk of material damage!

The use of heavy compaction equipment directly above the Vault may damage the Vault.

- ▶ Do not use mechanical compaction with vibrators directly above the Vault or pipes.
- ▶ Follow the standard EN 1610 in all backfilling steps.
- ▶ Ensure that the bedding heights H1, H2 follow the requirements in EN 1610 and other currently applicable local standards and regulations.
- Ensure that the width W follows the requirements in EN 1610 as a minimum. For safety reasons, a width of 1 m is recommended.



Pipe bedding

- ▶ Ensure that the bedding soil is free from stones within the width of the pipe pit.
- ▶ Prepare the pit bottom bedding layer according to EN 1610.
- ▶ Compact the bedding layer mechanically.
- ▶ For installation in soft or wet soil, place geotextile under the bedding to keep the bedding and native materials separate.

Primary backfill

- ▶ Use backfill material according to EN 1610.
- ▶ Backfill over the whole pit width.
- ▶ Compact the backfill material according to EN 1610.
- ▶ Fill in the final layer of the primary backfill according to EN 1610.
- ▶ Spread the primary backfill material carefully from a low height.
- ▶ Take special care when compacting the haunch area.
- ▶ Ensure that the Vault does not move during haunch area compaction.
- ▶ Place the primary backfill in even layers on both sides and in the lengthwise direction of the Vault.
- ▶ Ensure that the soil material used is not frozen.
- ▶ Ensure the minimum backfill level according to EN 1610 before compacting directly above the Vault.

Final backfill

- ▶ Ensure that the final backfill material is free from stones.
- ▶ Ensure that the final backfill material is compactable as dug materials or better.
- ▶ Follow the requirements for non-traffic or traffic areas described in EN 1610.
- ▶ Carry out compaction in several layers.

5.4.8 Installation under a traffic area

The Vault can be installed in areas up to load class D400 (according to EN 124). The backfill layer above the Vault is used to distribute the loads caused by pedestrian and vehicle traffic. The minimum total thickness of the backfill layer above the Vault (dimension [A]) is shown in the following table. The stiffness is determined according to ISO 9969.

Load class	Test load	Traffic group description	Vault SN2 [A]	Vault SN4 [A]	Vault SN8 [A]
D	400 kN	Areas where cars and lorries have access, including carriageways, hard shoulders, and pedestrian areas.	-	1.0 m	0.8 m
B	125 kN	Car parks and pedestrian areas where only occasional vehicular access is likely.	-	0.8 m	0.6 m
A	15 kN	Only pedestrians have access.	0.3 m	0.3 m	0.3 m

Shallower installations can be carried out by using a concrete load-bearing construction.

- Follow local standards and regulations for the minimum cover depth.

NOTE!

If the site conditions do not allow the minimum installation depth, and dimension [A] will be less than in the table, it is possible to construct a steel-reinforced concrete slab above the Vault. Landscaping designers must take all aspects of the site into account and define the structure and dimensions of load-distribution slab.

5.4.9 Risers and accessories

Risers/manholes can be included in the design for operation and maintenance. The riser top solution and riser cover are selected based on the riser pipe diameter. All traffic loads are transferred through the riser cover and riser top structure into the surrounding soil. This transfer ensures that no load is imposed on the Vault itself.

5.5 Removing the filter fixing straps

Filter chamber and Vortex are delivered with the filter cartridges pre-installed. The filter cartridges are secured with fixing straps during transport and installation.

- Remove all fixing straps securing the filter cartridges.

6 Operation

6.1 Safety instructions

WARNING!

Injury because of insufficient personnel qualification!

Danger of injury when unqualified personnel carry out installation, operation and maintenance.

- ▶ Only qualified personnel carry out all work.

WARNING!

Injury due to personal protective equipment not being worn!

Unprotected body parts may be injured.

- ▶ Wear the mandatory personal protective equipment.

WARNING!

Danger of drowning!

High water pressure can pose a risk of personal injury.

- ▶ Close all closing valves when working inside the treatment unit.
- ▶ Wear a safety belt when working inside the treatment unit.

WARNING!

Danger of suffocation!

Lack of oxygen inside the treatment unit can pose a risk of personal injury.

- ▶ Ensure sufficient air ventilation when working inside the treatment unit.
- ▶ Install or wear oxygen monitoring sensors.
- ▶ Do not work alone inside the treatment unit.

CAUTION!

Risk of electric shock!

Internal components may carry hazardous voltages that can cause serious injury or death if touched.

- ▶ Before working on wiring or terminals, always ensure the power supply is completely disconnected (zero potential).
- ▶ Installation, handling, and servicing must be performed only by qualified personnel trained in electrical safety and authorized to work on industrial instrumentation.

CAUTION!

Danger of falling over!

The inside of the treatment unit can still be slippery because of residual water, even if the treatment unit was drained or due to a biofilm or grease from equipment after maintenance.

- ▶ Wear safety shoes with non-slip soles.
- ▶ Do not step into residual puddles.

NOTICE!

Property damage because of insufficient personnel qualification!

Danger of property damage when unqualified personnel carry out installation, operation and maintenance.

- ▶ Only qualified personnel carry out all work.

6.2 Preparing for operation

- ▶ Ensure access to the treatment unit.
- ▶ Ensure that light and ventilation systems are working properly.
- ▶ Ensure that required blind flanges or blockings are installed properly.
- ▶ Familiarize yourself with the warning signs attached to the treatment unit.
- ▶ Ensure that the quality of the breathing air is monitored continuously or at regular intervals.
- ▶ Ensure that the personal protective equipment, footwear, workwear, and gloves meet water hygiene requirements.
- ▶ Ensure that the ladder is in good condition.

6.3 General operation

On a plant operation level, fulfill the following tasks:

- ▶ Consult the component manuals for component operation.
- ▶ Monitor and adjust the inflow water rate.
- ▶ Monitor and adjust the outflow water rate.
- ▶ Monitor and adjust the nominal flow.
- ▶ If applicable, turn on the heater to prevent freezing.

6.4 Cleaning

- ▶ Follow the component manuals on cleaning valves and measuring equipment.
- ▶ Only use chemicals approved for use with Weholite products.

7 Maintenance

A highly efficient operation of the treatment unit is only possible when regular maintenance is performed. This means the need for periodic inspection and cleaning of the treatment unit. This frequency will depend mainly on the amount of pollutants in the stormwater. Supplementary recommendations and regulations may result from the building permit and operating permit.

7.1 Safety instructions



WARNING!

Injury because of insufficient personnel qualification!

Danger of injury when unqualified personnel carry out installation, operation and maintenance.

- ▶ Only qualified personnel carry out all work.



WARNING!

Danger of explosion!

Smoking or using open flames inside the treatment unit may lead to the explosion of inflammable substances.

- ▶ Do not smoke or use open flames inside the treatment unit.



CAUTION!

Risk of injury due to leaking gaskets!

Danger of injury by leaking medium due to damaged or aged gaskets.

- ▶ If possible, store gaskets in a cool, dry and dark place.
- ▶ Before installing them, the gaskets must be checked on possible aging damages, such as fissures and hardenings.
- ▶ Regularly check the gaskets and replace them, where necessary.

NOTICE!

Property damage due to wrong cleaning agents!

The use of aggressive cleaning chemicals can cause damage to components.

- ▶ Do not use aggressive chemicals or cleaning agents when cleaning.
- ▶ If the treatment unit comes into contact with harsh chemicals, clean it thoroughly with a neutral detergent.

NOTICE!

Property damage because of insufficient personnel qualification!

Danger of property damage when unqualified personnel carry out installation, operation and maintenance.

- ▶ Only qualified personnel carry out all work.

To ensure the safety of personnel entering and maintaining a treatment unit, the following rules must be strictly followed:

- If applicable, employers are responsible for ensuring that all maintenance personnel are properly trained in the risks of electric shock and hazardous gases (e.g. toxic vapors) and are equipped with the necessary personal protective equipment (PPE).
- Failure to comply with safety requirements voids any liability or damage claims.
- ▶ Ensure thorough ventilation before entry to eliminate harmful gases and ensure a safe working atmosphere.
- ▶ Ensure that only one person stands on the treatment unit's internal service ladder at any time.
- ▶ Do not carry heavy or unwieldy items while climbing
- ▶ Do not work alone inside the treatment unit.

Compliance with standards and regulations

The treatment unit is designed to be entered for inspection and servicing. Therefore, all safety features, including ladders and handrails, must comply with the currently applicable standards and regulations. These requirements must be strictly observed during both installation and maintenance.

7.2 General maintenance guidelines

- ▶ Inspect the treatment unit visually after heavy rainfall.
- ▶ Regularly remove sludge and floating pollutants (e.g. oil or debris) from the treatment unit.
- ▶ If a separate sampling chamber is installed, regularly take water samples downstream of the treatment unit to assess water quality.
- ▶ Follow the safety regulations applicable to wastewater and pressurized systems during all maintenance activities.
- ▶ Document all maintenance activities in a service log.
- ▶ Maintain all installed equipment (e.g. gate valves, air valves, flow meters) according to the manufacturer's instructions.
- ▶ Ensure that waste management for any removed materials is handled by licensed companies and according to environmental regulations.
- ▶ Prepare for emergency scenarios (e.g. power outages) with backup power supply if applicable.
- ▶ During winter, ensure that lids and surrounding areas are kept free of ice and snow. Apply frost protection or insulation as required by local regulations and site conditions.

7.3 Preparing for maintenance

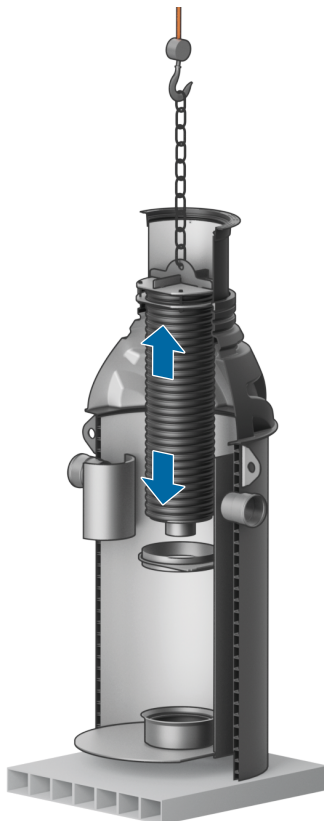
1. Secure and mark the working area from all sides according to the local guidelines.
2. If working inside the treatment unit, open the manhole riser.
3. Secure the manhole against falling inside.
4. Ensure the interior of the treatment unit is sufficiently illuminated.

7.4 Maintenance work

7.4.1 Filter chamber

Filter replacement interval

The recommended filter replacement interval is 3 to 5 years. The length of the replacement interval is determined by sampling or if clogging is detected. If sampling has not been carried out, it is recommended to replace the filter every 3 years.



Filter removal

1. Lower the water level in the filter chamber.
2. Open the lid above the filter to be replaced.
3. Lift the filter cartridge out of the filter chamber using the attached chain and suitable lifting equipment.
4. Replace the filter cartridge with a new one or replace the filter material in the filter cartridge.

Filter material replacement

- See chapter 7.5 for filter material replacement.

Filter installation

1. Make sure that the gasket is at the correct position at the filter cartridge.
2. Lower the filter cartridge through the filter guide down into the filter base.
3. Check that the top of the filter is level with the depth indicator at the filter guide.
4. Hook the lifting chain to the fastener in the riser pipe.
5. Close and lock the lid.

7.4.2 Vortex

The Vortex does not need product-specific maintenance beyond what is described in the general maintenance guidelines (see page 45).

7.4.3 Vault

Filter replacement interval

The recommended filter replacement interval is 3 to 5 years. The length of the replacement interval is determined by sampling or if clogging is detected. If sampling has not been carried out, it is recommended to replace the filter every 3 years.



Filter removal

1. Lower the water level in the Vault.
2. Open the lid above the filter to be replaced.
3. Lift the filter cartridge out of the Vault using the attached chain and suitable lifting equipment.
4. Replace the filter cartridge with a new one or replace the filter material in the filter cartridge.

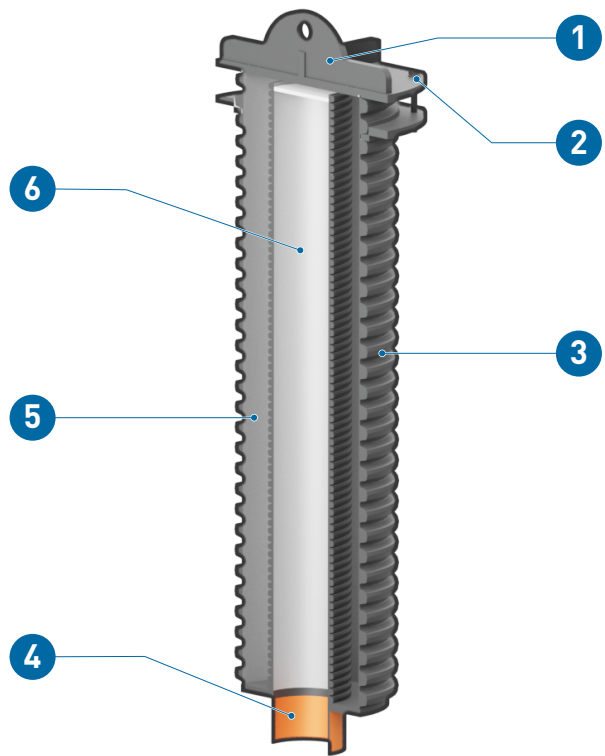
Filter material replacement

► See chapter 7.5 for filter material replacement.

Filter installation

- 1. Make sure that the gasket is at the correct position at the filter cartridge.
- 2. Lower the filter cartridge through the filter guide down into the filter base.
- 3. Check that the top of the filter is level with the depth indicator at the filter guide.
- 4. Hook the lifting chain to the fastener in the riser pipe.
- 5. Close and lock the lid.

7.5 Filter material replacement



Pos.	Designation	Pos.	Designation
1	Filter cartridge cover	4	Outlet
2	Cover screws	5	Filter material
3	Filter cartridge body	6	Inner pipe

- 1. Remove the 4 screws from the cover of the filter cartridge.
- 2. Remove the cover from the filter cartridge.
- 3. Empty the cartridge.
- 4. Fill the space between the inner and outer tube of the filter cartridge with the correct amount of new filter material (see tables below).
- 5. Place the cover on the filter cartridge.
- 6. Tighten the 4 screws to secure the cover.

Filter material		
Filter chamber model	Filter	Amount of filter material [l]
160	1 x 1,5 m	130
200	1 x 1,5 m	130
250	1 x 2,0 m	180
315	2 x 1,5 m	260
400	2 x 2,0 m	360
400	4 x 1,5 m	520
500	4 x 2,0 m	720

Filter material		
Vault model	Filter	Amount of filter material [l]
300	2 x 1.5 m	260
400	2 x 1.5 m	260
500	4 x 1.5 m	520
600	4 x 1.5 m	520
800	6 x 1.5 m	780
1000	12 x 1.5 m	1560
1200	16 x 2 m	2880

7.6 End of maintenance work

- After maintenance work or during a predicted break in work, tidy up the entire work area in such a way that there is no danger to human health and life.

7.7 Disposal of separated substances

- Waste accumulated in the product in the form of oily sands and oils are classified as hazardous waste.
- All removed contaminants must be taken to landfills or to catchment points after prior consultation and location by the appropriate territorial sanitary authorities and institutions related to environmental protection.
- Have both the transport and disposal of the separation products carried out by authorized companies that have the appropriate license to provide such services.
- Keep waste management documents.

7.8 Service log

[illegible]

8 Troubleshooting

8.1 Safety instructions



CAUTION!

Risk of electric shock!

Internal components may carry hazardous voltages that can cause serious injury or death if touched.

- ▶ Before working on wiring or terminals, always ensure the power supply is completely disconnected (zero potential).
- ▶ Installation, handling, and servicing must be performed only by qualified personnel trained in electrical safety and authorized to work on industrial instrumentation.

8.2 Detecting a fault

- The treatment unit does not work properly.
- If the treatment unit contains a control panel with a display, an error code or fault message is displayed.

8.3 Correcting a fault

- ▶ Always work systematically and purposefully, even when under time pressure. Random, thoughtless disassembly and changing of settings might result in an inability to determine the original cause of the error.
- ▶ Get a general idea of the function of the treatment unit in conjunction with the overall system.
- ▶ Try to find out whether the treatment unit or a functional part of it worked properly in conjunction with the overall system before the error occurred.
- ▶ Try to clarify the cause of the error.
- ▶ Check whether any changes were made immediately before the error occurred.
- Were there any changes to the conditions or the area of application of the treatment unit?
- Were any changes (e.g. refitting) or repairs carried out on the overall system or on the treatment unit?
- Was the treatment unit used as intended?
- Have the environmental conditions changed?
- How did the fault become apparent?

Fault	Recommended action
There is no water in the pipes going into the treatment unit	▶ Check that all relevant shut-off valves are open. ▶ Check that all settings are correct. ▶ Check that all relevant filters are clean.
The filter tilts or moves in the filter base.	▶ Make sure that the top of the filter is level with the depth indicator at the filter guide.
There is no water flow through the treatment unit.	▶ Check if the treatment unit is clogged. ▶ Remove any sludge or debris from the treatment unit. ▶ Check if the filter is clogged. ▶ Replace the filter or the filter material.
There is an issue with a component attached to the treatment unit.	▶ Consult the component manual.

- ▶ For support regarding any fault, visit the website www.gfps.com/our-locations to contact your local GF specialist.

9 Disposal

NOTICE!

Proper disposal!

- ▶ Before disposal, separate the individual materials into recyclable materials, normal waste and hazardous waste.
- ▶ For questions concerning the disposal of the treatment unit, contact your national representative of GF Industry and Infrastructure Flow Solutions.
- ▶ Observe local regulations, standards and guidelines.
- ▶ Consult the safety data sheet of the treatment unit.
- ▶ treatment units with electrical components must be disposed of separately.
- ▶ A treatment unit marked with this symbol must be taken to separate collection of electrical and electronic equipment:



The full plastic treatment unit body can be recycled as such by companies specialized in recycling plastic complexes into products, that don't require drinking water approval and allow using recycled raw materials. Up-to-date list of such companies can be viewed from local plastic manufacturers associations web pages.

10 Spare parts and accessories

10.1 Spare parts

Article	Article number	Volume
Filter 1,5 m	35001135105	130 l
Filter 2,0 m	35001135106	180 l
Filter material	35001144331	

10.2 Accessories

Contact your GF representative for information on accessories for your GF product.

Excellence in Flow

Visit our webpage to get in touch with your local specialist:

www.georgfischer.com/locations



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